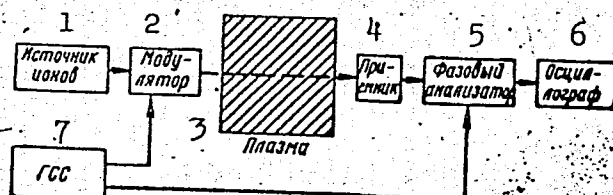


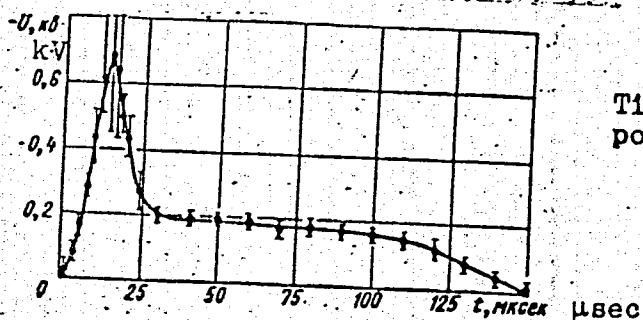
ACCESSION NR: AT4025313

ENCLOSURE: 02

Block diagram of potential-well measurement



- 1 - ion source, 2 - modulator
- 3 - plasma, 4 - receiver,
- 5 - phase analyzer,
- 6 - oscilloscope,
- 7 - standard signal generator



Time dependence of the potential

Card 4/4

ACCESSION NR: AT4036066

S/2781/63/000/003/0237/0250

AUTHORS: Azovskiy, Yu. S.; Guzhovskiy, I. T.; Mazalov, Yu. P.; Mank, V. V.; Safronov, B. G.; Churayev, V. A.

TITLE: Inductive conical plasmoid source

SOURCE: Konferentsiya po fizike plazmy* i problemam upravlyayemogo termoyadernogo sinteza. 3d, Kharkov, 1962. Fizika plazmy* i problemy* upravlyayemogo termoyadernogo sinteza (Plasma physics and problems of controlled thermonuclear synthesis); doklady* konferentsii, no. 3. Kiev, Izd-vo AN UkrSSR, 1963, 237-250

TOPIC TAGS: plasmoid, plasma source, plasma radiation, plasma research, microwave plasma, charged particle concentration, plasma density, ionized plasma

ABSTRACT: An inductive plasmoid source with a conical single-turn coil was investigated, and the plasmoids produced by it were studied

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ACCESSION NR: AT4036066

by recording the visible radiation of the plasmoids with a photomultiplier and by recording the plasmoid currents with magnetic probes. The plasmoid velocity was determined from the Doppler effect produced when microwave radiation is reflected from the front of the plasmoid. The charged-particle density in the plasmoid was determined by the microwave-signal "cutoff" method (I. S. Shpigel', ZhETF, 36, 411, 1959), and the mass composition of the plasmoid was determined with a Thomson mass analyzer (parabola method). The conclusions drawn from the results are as follows: 1. The sources produce hydrogen plasmoids with density exceeding $2 \times 10^{14} \text{ cm}^{-3}$ at an average velocity $3 \times 10^5 \text{ m/sec}$ (450 eV) and a total number of particles 10^{19} (approximately 0.5 cm^3). The total plasmoid energy is of the order of 1,000 J (25% of the energy fed to the coil and 8% of the capacitor-bank energy). The currents circulating in the plasmoids are of the order of 10^4 A and attenuate far away from the source. The plasma impurities amount to about 10% (only 1% in the front part of the plasmoid) and the plasmoid length is relatively

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ACCESSION NR: AT4036066

large (6--8 meters). The source efficiency can be increased by pre-ionization of the neutral gas. "The authors are grateful to Ye. F. Malayev for help in the erection of the apparatus, to I. Yu. Adamov, A. I. Skibenko, and V. I. Privezentsev for measuring the particle density, and to V. S. Voytsena for useful advice in the mass analysis of the plasmoids. Orig. art. has: 10 figures, 1 formula, and 2 tables.

ASSOCIATION: None

SUBMITTED: 00

DATE ACQ: 21May64

ENCL: 01

SUB CODE: ME

NR REF SOV: 008

OTHER: 011

Card 3/4

SAFRONOV, B. G.

1 sheet

ACCESSION NR: AT4036067

S/2781/63/000/003/0250/0255

AUTHORS: Azovskiy, Yu. S.; Guzhovskiy, I. T.; Safronov, B. G.;
Churayev, V. A.

TITLE: Conical plasmoid source

SOURCE: Konferentsiya po fizike plazmy* i problemam upravlyayemogo termoyadernogo sinteza. 3d, Kharkov, 1962. Fizika plazmy* i problemy upravlyayemogo termoyadernogo sinteza (Plasma physics and problems of controlled thermonuclear synthesis); doklady* konferentsii, no. 3. Kiev, Izd-vo AN UkrSSR, 1963, 250-255

TOPIC TAGS: plasmoid, plasma source, plasma radiation, plasma research, microwave plasma, plasmoid acceleration, plasma density

ABSTRACT: Plasmoids produced by a conical source were investigated in an experimental setup consisting of a plasma source and a vacuum chamber. The conical plasma source was similar to that described

Cord 1/5

ACCESSION NR: AT4036067

elsewhere (Fizika plazmy* i problemy* upravlyayemogo termoyadernogo sinteza, no. 2, Izd-vo AN UkrSSR, 1963) but had different dimensions. The vacuum chamber was a glass tube with inside diameter 67 mm. The initial pressure in the vacuum system did not exceed 2.7×10^{-3} m/m² (2×10^{-5} mm Hg). The plasmoid parameters were investigated with the following equipment: 1. Photomultiplier to register the glow of the ionized gas. 2. Magnetic probe to register the variation of the external magnetic field due to the plasmoid motion (or the magnetic field of the plasmoid currents in the absence of an external field). 3. The velocity of the plasmoid layer with density 1×10^{12} cm⁻³ was determined by the microwave signal "cutoff" method with a signal of frequency 9.5×10^9 cps. Oscillograms of all these data were used to determine the delay curves, the dependence of the plasmoid velocity on the initial capacitor bank voltage, and the dependence of the plasmoid velocity on the energy fed to the plasma source. The investigation confirmed the previously obtained results. To ascertain the effect of different parameters of the discharge circuit on the source

Card 2/5

ACCESSION NR: AT4036067

operation, several capacitor banks were used with different ratios of the total circuit inductance to the source inductance. Orig. art. has: 5 figures.

ASSOCIATION: None

SUBMITTED: 00

DATE ACQ: 21May64

ENCL: 02

SUB CODE: ME

NR REF SOV: 002'

OTHER: 002

Card 3/5

ACCESSION NR: AT4036068

S/2781/63/000/003/0255/0261

AUTHORS: Belikov, A. G.; Goncharenko, V. P.; Mishchenko, V. M.;
Safronov, B. G.; Slavny*y, A. S.

TITLE: Investigation of coaxial plasma accelerator

SOURCE: Konferentsiya po fizike plazmy* i problemam upravlyayemogo
termoyadernogo sinteza. 3d, Kharkov, 1962. Fizika plazmy* i prob-
lemy* upravlyayemogo termoyadernogo sinteza (Plasma physics and
problems of controlled thermonuclear synthesis); doklady* konferen-
tsii, no. 3. Kiev, Izd-vo AN UkrSSR, 1963, 255-261

TOPIC TAGS: plasmoid, plasmoid acceleration, plasma source, high
temperature plasma, plasma density, discharge plasma

ABSTRACT: A coaxial electrodynamic plasma accelerator is investi-
gated in order to determine some of its parameters, namely the plas-
moid velocity, the plasmoid density, the contamination of the plas-

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ACCESSION NR: AT4036068

ma with heavy ions, and the energy distribution of the ions. The electrodynamic plasma accelerator consists of two coaxial cylinders (72 and 32 mm inside diameter, length of accelerating electrodes 175 mm). The pressure used was $(1-3) \times 10^{-3}$ m/m², and the working volume was filled with gas using a pulsed valve described by J. Marshall (Fizika goryachey plazmy* i termoyaderny*ye reaktsii, Atomizdat, M. 1959, p. 290). The acceleration of the plasma by the coaxial accelerator was investigated as a function of the delay between the start of the entry of the gas into the working volume (more accurately, the start of operation of the hammer of the valve) and the discharge of the source. The discharge was investigated with an internal magnetic probe. The plasmoid velocity was measured with optical (photomultiplier) and external magnetic probes. The mass composition and the energy of the ions of the plasmoids were determined by the Thomson parabola method. The results have shown that two plasmoids, moving with different velocities, are produced during the acceleration of a plasma with a coaxial electrodynamic

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ACCESSION NR: AT4036068

source. The formation of the plasmoids is not connected with the periodicity of the discharge in the source. Further research is necessary to ascertain the nature of the first plasmoid. The charged particle density exceeds 10^{13} cm^{-3} , the hydrogen ion energy in the fast plasmoid reaches 4--5 keV, and the plasmoid impurities are high, 50--60% in the slow plasmoid and less in the fast one. Exact determination of the impurity contents in the fast plasmoid is difficult. Orig. art. has: 10 figures.

ASSOCIATION: None

SUBMITTED: 00

DATE ACQ: 21May64

ENCL: 01

SUB CODE: ME

NR REF SOV: 002

OTHER: 003

Card 3/4

ACCESSION NR: AT4036068

ENCLOSURE: 01

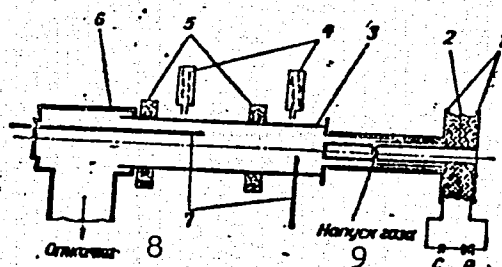


Diagram of accelerator: 1 - source electrodes, 2 - insulator,
3 - glass tube, 4 - photomultiplier, 5 - external magnetic
probe, 6 - vacuum chamber, 7 - internal magnetic probe,
8 - vacuum, 9 - gas inlet

Card 4/4

SINEL'NIKOV, K.D.; AZOVSKIY, Yu.S.; GUZHOVSKIY, I.T.; PANCHENKO, V.Ye.;
SAFRONOV, B.G.

Interaction of plasma bunches with an axially symmetric magnetic
field. Zhur. tekhn. fiz. 33 no.10:1159-1168 0 '63.

(MIRA 16:11)

AZOVSKIY, Yu.S.; GUZHOVSKIY, I.T.; MAZALOV, Yu.P.; MANK, V.V.; SAFRONOV, B.G.;
CHURAYEV, V.A.

Conical induction source of plasma bunches. Zhur. tekhn. fiz.
33 no.10:1149-1158 0 '63. (MIRA 16:11)

L 49420-65 EWT(1)/EPF(n)-2/EWG(m)/EPA(w)-2 Po-4/Pz-6/Pab-10/P1-4 IJP(c)
 AT/WW
 ACCESSION NR: AT5006095 8/3136/64/000/663/0001/0060
 AUTHOR: Komel'kov V. S.; Safronov, B. G. 21 53 52 15
 TITLE: Pulsed plasma injectors. Interaction between plasmoids and magnetic fields
 SOURCE: Moscow. Institut atomnoy energii. Doklady, no. 663, 1964. Impul'snyye plazmennyye inzhektory. Vzaimodeystviye plazmennyykh agustkov a magnitnymi polyami, 1-60
 TOPIC TAGS: plasmoid, plasma injection, plasma pinch, plasma magnetic field interaction, pulsed plasma
 ABSTRACT: The paper reviews research on plasma injectors and the interaction between plasmoids and magnetic fields, carried out in the Soviet Union recently and still unpublished. It is stated in the introduction that whereas until some time ago the bulk of the information on plasma injectors was concerned with the characteristics of the injectors themselves, present research is devoted primarily to the micromechanisms which determine the main processes and the properties of the plasmoids. Research projects carried out at various institutions are briefly described, and the names of the scientists in charge are given. It is stated in the

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L 49420-65

ACCESSION NR: AT5006095

conclusions that pulsed plasma injectors are still the only sources of high-density plasma, but they generate plasmoids containing many impurities. Various methods of ridding the plasma of the impurities are discussed and the general conclusion is that elimination of neutral and slow particles from the plasmoids is feasible. Maximum purity can be attained by controlling the initial gas distribution in the working volume. The most efficient of the cylindrical coaxial injectors are those producing "gushing" pinches (end-type injectors). The nature of the frontal plasmoids, which move with velocities exceeding the velocity of the current layer, still remains unclear, and the experimental data indicate that the "snow plough" model used to describe acceleration in injectors is not applicable. The section headings are: Introduction. I. Pulsed plasma injectors. 1. Coaxial injectors. 2. Coaxial injector with plasma focusing. 3. End-type injectors. 4. Titanium plasma source. II. Motion of plasmoids in magnetic fields. 1. Motion of plasmoids in longitudinal magnetic fields. 2. Blocking of impurities by fast growing longitudinal magnetic fields. 3. Interaction of plasmoids with a transverse magnetic field. Conclusions. Literature. Orig. art. has: 38 figures, 2 formulas, and 1 table.

ASSOCIATION: Institut atomnoy energii im. I. V. Kurchatova (Institute of Atomic Energy)

Card 2/3

L 49420-65

ACCESSION NR: AT5006095

SUBMITTED: 00

ENCL: 00

SUB CODE: ME, NP

NR REF SOV: 022

OTHER: 015

Card 3/3

ACCESSION NR: AP4013415

S/0057/64/034/002/0280/0287

AUTHOR: Voytsenya, V.S.; Borbanyuk, A.G.; Onishchenko, I.M.; Safronov, B.G.

TITLE: Motion of dense plasma bursts in the magnetic field of a toroidal solenoid

SOURCE: Zhurnal tekhn.fiz., v.34, no.2, 1964, 280-287

TOPIC TAGS: plasma, plasma burst, plasma burst purification, toroidal solenoid, toroidal magnetic field, hydrogen ion, oxygen ion, carbon ion

ABSTRACT: Because of the technical importance of toroidal magnetic fields as means of purifying plasma bursts (B.G.Safronov, V.S.Voytsenya, I.I.Konovalov, ZhTF, 32, No.6, 678, 1962) and in order to test the theory developed by N.A.Khizhnyak (Sb.doklady III konferentsii po fizike plazmy*, FTI AN USSR. Izd.AN USSR, Kiev, 1963), the motion of dense plasma bursts in a toroidal magnetic field was investigated experimentally. The plasma bursts were produced by a conical plasma gun; they had densities exceeding 10^{13} cm^{-3} and velocities of the order of 10^7 cm/sec . The 6 cm diameter glass drift tube formed a quarter of a torus having a radius of curvature of 60 cm. A solenoid about the drift tube produced a magnetic field of up to 1000 Gs in the tube. At the end of the drift tube the composition of the plasma bursts was determined by

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ACCESSION NR : AP4013415

a mass spectrometer. The electric polarization field was also measured, and the density was determined by microwave absorption. The initial composition of the bursts was determined. For comparison, the composition of bursts was determined after they had traversed a straight drift tube identical in all other respects with the toroidal tube. The plasma bursts originally contained about 20% hydrogen ions, with the remainder consisting mostly of O I, O II, C I, C II, C III, and C IV. After traversing the straight drift tube with a 1000 Oe magnetic field the bursts still contained about 20% hydrogen; with smaller magnetic fields the hydrogen content was less. After traversing the toroidal drift tube a burst contained as a whole about 80% hydrogen. The heavy ions traversing the toroidal field, mostly C I, were concentrated in the "tail" of the burst, and the forward 60% of the burst contained only 2% heavy ions. Electric polarization fields due to centrifugal drift were found to be absent or small except at the foremost portion of the burst where the density is small. The reason for the short duration of the polarization field is not understood. It is concluded that Khizhnyak's theory (loc.cit.supra) gives a correct qualitative description of the purification process, that the plasma bursts cannot reach the wall of the chamber, and that very pure plasma bursts can be obtained with the aid of a toroidal magnetic field provided only the forward portion of the burst is accepted. In conclusion we consider it our pleasant duty to thank K.D.Sinel'nikov

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ACCESSION NR: APL013415

and N.A. Khizhnyak for constant interest in the work and for valuable discussions."
Orig. art. has: 2 formulas and 8 figures.

ASSOCIATION: none

SUBMITTED: 03Dec62

DATE ACQ: 26Feb64

ENCL: 00

SUB CODE: PH

NR SOV. REF: 004

OTHER: 002

3/3
Card

ACCESSION NR: AP4035693

S/0057/64/034/005/0841/0846

AUTHOR: Azovskiy, Yu.S.; Guzhovskiy, I.T.; Safronov, B.G.

TITLE: A conical source of plasma bursts with electrodes and pulsed admission of gas

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.5, 1964, 841-846

TOPIC TAGS: plasma, plasma jet, plasma source, hydrogen plasma

ABSTRACT: A conical source of plasma bursts was constructed as shown in the figure (Enclosure 01), and its behavior was investigated. The work was undertaken in an effort to develop a source that would produce bursts comparable in purity with those obtained with an induction source (Yu.S.Azovskiy, I.T.Guzhovskiy, Yu.P.Mazalov, V.V.Mank, B.G.Safronov and V.A.Churayev, ZhTF 33,1149,1963) while employing the simple external circuitry of previously investigated plastic sources (Yu.S.Azovskiy, I.T.Guzhovskiy, B.G.Safronov and V.A.Churayev, ZhTF 32,1050,1962). Hydrogen (usually 2 or 3 cm³) was admitted to the discharge chamber, and after a delay of 210, 270 or 350 microsec (of which about 175 were required for the valve to open) a 6 microfarad capacitor, charged to between 5 and 20 kV, was discharged across it. The resulting

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ACCESSION NR: AP4035693

plasma bursts were investigated in various ways: 1) the ion content was analyzed with a mass spectrometer; 2) the visible radiation was detected with a photomultiplier and displayed on an oscillograph; 3) the currents in the plasma bursts were detected with a movable magnetic probe (1.4 mm diameter, 8 mm long) and displayed on an oscillograph; 4) the cut-off of 37 500 megacycle microwaves was observed; 5) the relative energies of the bursts were determined with a thermocouple probe. The plasma bursts contained from 70 to 90% hydrogen, including a small quantity of H_2^+ and H_3^+ . The principal impurities were carbon and oxygen from the pump oil vapor, and to a lesser extent, sodium and silicon from the glass walls, and copper and zinc from the brass electrodes. Several bursts were ejected during each discharge. In general, one burst was ejected during each half cycle (4.5 microsec), but two or even three bursts were frequently ejected during the first half cycle. This multiple ejection during the first half cycle is tentatively ascribed to radial oscillations of the pinched discharge. The plasma bursts completely cut off the microwaves; their charged particle density therefore exceeded $1.7 \times 10^{13} \text{ cm}^{-3}$. The velocity of the bursts was directly proportional to the discharge voltage and increased with decreasing delay between gas admission and firing. The first burst ejected was the most rapid. With a 210 microsec delay and a 10 kV discharge potential, the velocity of the

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ACCESSION NR: AP4035693

first burst was 5.3×10^6 cm/sec. Currents circulated in the plasma bursts in the same direction as in the winding about the discharge chamber. These currents decreased with time at a rate approximately proportional to the velocity of the burst, so that the current had decreased by a factor e when the burst had traveled 7.2 cm from the source. Similar behavior was observed in the much more rapid bursts from the induction source (loc.cit.supra), the corresponding distance in this case being 8.8 cm. It is accordingly suggested that the decay of the current is due less to the finite conductivity of the plasma than to expansion and interaction with the wall of the drift tube. "In conclusion the authors express their gratitude to V.A. Churayev and N.G.Shulika for their participation in several preliminary experiments" Orig.art.has: 5 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 09May63

DATE ACQ: 20May64

ENCL: 01

SUB CODE: ME

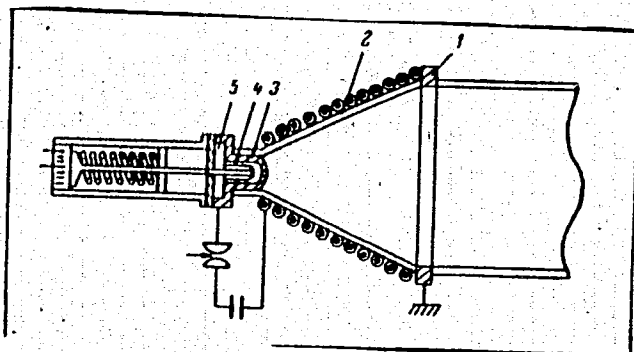
NR REF SOV: 004

OTHER: 000

Card 3/4

ACCESSION NR: AP4035693

ENCLOSURE : 01



Conical plasma source: 1) brass ring electrode, i.d. 9 cm, 2) glass wall of conical discharge chamber (vertex angle 50°) supporting a 12 turn coil, 3) brass cylindrical electrode, o.d. 1.5 cm, 4) valve head, 5) teflon seal.

Card 4/4

S/0057/64/034/005/0847/0852

ACCESSION NR: AP4035694

AUTHOR: Belikov, A.G.; Goncharenko, V.P.; Mishchenko, V.M.; Safronov, B.G.; Slavnyy, A.S.

TITLE: Production of fast plasma bursts with a coaxial plasma gun

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.5, 1964, 847-852

TOPIC TAGS: plasma, plasma gun, coaxial gun, plasma burst, fast ion

ABSTRACT: This paper reports a continuation of previous work by the same five authors (Sb. "Fizika plazmy i problemy upravlyayemogo termoyadernogo sinteza", No.3, Izd. AN USSR, Kiev, 1964). The velocity, density and other properties of deuterium plasma bursts obtained with a coaxial cylindrical plasma gun were determined as functions of the discharge voltage and the time delay between admission of the gas and initiation of the discharge. Plasma bursts were obtained which contained more than 10^{17} particles and had densities greater than 10^{13} cm^{-3} and velocities greater than $8 \text{ to } 9 \times 10^7 \text{ cm/sec}$. The plasma gun consisted of two coaxial cylinders 32 mm and 72 mm in diameter and 17.5 cm long. One cubic centimeter (standard conditions) of deuterium was admitted to the annular space through openings in the wall of the in-

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ACCESSION NR: AP4035694

ner cylinder. Gas began to enter the interelectrode space 170 microsec after the valve was triggered, and the valve remained open for 80 microsec. A 27-microfarad capacitor charged to 20 kV or less was discharged through the gun. The resulting plasma burst was observed in a 95-mm glass drift tube. No confining axial magnetic field was used. The plasma bursts were analyzed with a Thomson mass spectrometer located 2.5 meters from the source. The velocity of the bursts was determined from the flight time between two external magnetic probes located 80 cm and 200 cm from the gun. The density was monitored by observing the cut-off of 8-mm microwaves at 80 cm from the source. In some cases the total energy of the plasma was estimated from calorimetric measurements. The ions in the plasma bursts were distributed over a wide range of energies. The velocity of the burst as determined from the flight time between the two magnetic probes agreed with that calculated from the ion energies as measured with the mass spectrometer. The highest velocities were achieved with a delay (between triggering the gun and applying the potential) of 200 to 250 microsec. When the delay was less than 170 microsec, gas did not enter the interelectrode space until after the potential had been applied. Under these conditions only slow bursts were formed. Normally there were two bursts per shot, and these had widely different velocities. When the delay was increased beyond about 250

2/3

Card

ACCESSION NR: AP4035694

microsec, the slow burst grew in size at the expense of the fast one, and the two bursts tended to merge. Orig.art.has: 2 formulas, 9 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 11May63

SUB CODE: ME, NP

DATE ACQ: 20May64

ENCL: 00

NR REF SOV: 001

OTHER: 002

3/3

Card

ACCESSION NR: AP4040302

S/0057/64/034/006/1011/1012

AUTHOR: Azovskiy, Yu.S.; Guzhovskiy, I.T.; Safronov, B.G.

TITLE: Concerning measurement of the energy of plasma bursts with thermal probes

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.6, 1964, 1011-1012

TOPIC TAGS: plasma, plasma source, plasma jet, plasma temperature .

ABSTRACT: The energies of plasma bursts from a conical plasma gun described elsewhere (Yu.S.Azovskiy, I.T.Guzhovskiy and B.T.Safronov, ZhTF 34,73,1964) were measured with a number of differently constructed thermal probes in order to obtain information concerning the errors involved in such measurements. The probes were 1.4 cm diameter cylinders of 0.1 mm copper foil, closed at one end, and were positioned with the open end toward the incident plasma. Probes were tested for which the ratio L/D of length to diameter was 0 (disc), 1,2 and 3. The equilibration time of the probes was of the order of one second, and the cooling time (due mainly to conduction through the thermocouple leads) was of the order of one minute. The probes tested with and without a conical shield, thermally insulated from the probe, which prevented the plasma flowing past the probe from coming in contact with the outer

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ACCESSION NR: AP4040302

wall. The energy indicated by both the shielded and the unshielded probes (temperature rise divided by heat capacity) increased monotonically with increasing L/D. For the unshielded probes this rise was nearly linear; the curve for the shielded probes reached a constant value for L/D greater than about 2 or 3. The low readings obtained with the disc and the short cylindrical probes are ascribed to the formation of a plasma "cushion" due to a shock wave propagating up stream, which shields the probe from the plasma. The high readings obtained with the long unshielded cylindrical probes are ascribed to heat influx through the cylindrical wall of the probe in contact with the flowing plasma. The reading of even the flat probe was smaller when the conical shield was employed than when it was unshielded; this indicates that plasma can strike the rear face of the disc. It is concluded that while thermal probes of any shape may be useful for relative measurements over a small energy range, absolute measurements require a deep hollow shielded probe. Orig.art.has: 1 figure..

ASSOCIATION: none

SUBMITTED: 24Jun63

SUB CODE: ME

DATE ACQ: 18Jun64

NR REF SOV: 004

ENCL: 00

OTHER: 001

Card 2/2

ACCESSION NR: AP4041992

S/0057/64/034/007/1183/1190

AUTHOR: Demidenko, I.I.; Padalka, V.G.; Safronov, B.G.; Sinel'nikov, K.D.

TITLE: Interaction of plasma bursts with a transverse magnetic field

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.7, 1964, 1183-1190

TOPIC TAGS: plasma, plasma-magnetic field interaction, plasmoid, plasma source

ABSTRACT: The behavior of plasma bursts on meeting a transverse magnetic field was investigated experimentally. The plasma bursts were produced by 15-kv discharges of a 3-microfarad capacitor bank through a conical plasma gun with plastic walls, and traveled at 2.3×10^6 cm/sec down an 8-cm-diameter copper drift tube. At 70 cm from the plasma gun the drift tube intersected, at right angles, a second copper tube 10 cm in diameter, in which an approximately uniform axial magnetic field of a strength up to 725 oe was maintained with a solenoid. The behavior of the plasmas was observed with magnetic probes, a shielded electric probe, and a "plasmascop" (a fluorescent screen which is photographed when the plasma impinges upon it). Mass spectroscopic analyses of the plasmas were also performed. When a plasma burst entered the transverse magnetic field, a portion of it passed through the field in

Card

1/3

ACCESSION NR: AP4041992

the original direction with reduced velocity, and a portion of it was "captured" by the field and traveled down the side tube in both directions along the lines of force. The captured plasma moved virtually parallel to the lines of force (the shadow image of a grid of 8-mm-diameter holes on 8-mm centers was quite sharp at 30 cm) and it traveled with a considerably greater velocity than the original plasma burst. The velocity of the captured plasma increased with increasing magnetic field, and amounted to 6.3×10^6 cm/sec in a field of 450 oe. The portion of the plasma traversing the magnetic field suffered a displacement perpendicular both to the field and to the direction of motion. It is suggested that this displacement is due to drift resulting from a longitudinal polarization of the plasma. The plasma consisted chiefly of H^+ , C^+ , O^+ , Fe^+ , C^{2+} , O^{2+} , and O^{3+} . Most of the heavy ions traversed the transverse field, and only H^+ and C^+ were found in the captured portion. The mechanism of the capture and acceleration of the plasma by the transverse magnetic field is discussed very briefly; it is not understood. The authors assert that a pure hydrogen plasma is much more easily captured by a transverse magnetic field than the impure plasmas investigated in the present work, and they call for further investigation of the role of the heavy ions in this process. Orig.art.has: 10 figures and 2 tables.

Card

2/3

ACCESSION NR: AP4041992

ASSOCIATION: none

SUBMITTED: 22Jul63

SUB CODE: ME

ATD PRESS: 3081

NR REF SOW: 003

ENCL: 00

OTHER: 002

Card 3/3

L 19022-65 EWT(1)/EWG(k)/EPA(sp)-2/EPA(w)-2/EEG(t)/T/EEG(b)-2/EWA(m)-2
 PI-I/Po-I/Pz-6/Pab-10 IJP(c)/RAEM(a)/AFTC(p)/ASD(f)-2/SSD/SSD(b)/AEDC(b)/AFWL/
 ACCESSION NR: AP4049054 ASD(a)-5/AFETR/ESD(g) AT 8/0057/64/034/011/2083/2085

AUTHOR: Voytsenya, V. S.; Gorbanyuk, A. G.; Onishchenko, I. N.; Safronov, B. G.; Shkoda, V. V.

TITLE: Concerning the polarization of a plasma burst in a uniform axially symme-
 tric magnetic field

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.11, 1964, 2083-2085

TOPIC TAGS: plasma, plasma polarization, plasma electric field, magnetic field
 plasma effect, plasma gun

ABSTRACT: The authors have measured the radial electric field in plasma bursts moving axially in a 6 cm diameter glass drift tube in a uniform longitudinal magnetic field. The investigated range of plasma velocities and magnetic field strengths is not given, but it included a velocity of 1.2×10^7 cm/sec and a field strength of 700 Oe. After leaving the conical plasma gun in which it was produced, the plasma burst passed successively through a grounded metal screen and three 2 cm diameter collimating openings at 5 cm intervals before entering the magnetic field. The electric field in the plasma was measured with two radially adjustable probes located 50 cm from the plasma gun. Radial electric fields with strengths up

1/2

L 19022-65

ACCESSION NR: AP4049054

to 10 V/cm were observed; these fields were directed toward the axis. The electric field strength was not strongly dependent on the magnetic field strength, but the half-width of the potential curve decreased with increasing magnetic field. The effect of sharpening the transition from the field-free region to the uniform field by the use of iron was investigated in order to determine whether the electric polarization of the plasma might be due to processes occurring in the non-uniform field. Altering the magnetic field in the non-uniform region had very little effect on the electric field, and it is concluded that the electric field was due to the difference between the ion and electron Larmor radii in the uniform magnetic field, to an uncompensated negative space charge, or to a rotation of the plasma. A decision between these three probabilities cannot be reached on the basis of the present experiments. "The authors express their gratitude to K.D. Sinel'nikov for his support of the present work and for valuable discussions." Orig.art.has: 3 figures.

ASSOCIATION: none

SUBMITTED: 20Feb64

SUB CODE: ME, EM

NR REF SOV: 003

ENCL: 00

OTHER: 004

2/2

L 6728-65 EWT(1)/EWG(k)/EWT(m)/EPA(sp)-2/EPF(c)/EPA(w)-2/EEC(t)/T/EEC(b)-2/
 EWP(q)/EWP(b)/EWA(m)-2 Pf-L/Pi-L/Po-L/Pr-L/Pz-6/Pab-24 IJP(c)/AEDC(b)/ASD(p)-3
 RAEM(a)/SSD/AFWL/AFETR/ESD(gs)/ESD(t) AT/JD/HM
 ACCESSION NR: AP4044877 S/0020/64/157/006/1335/1337
 115

AUTHORS: Demidenko, I. I.; Padalka, V. G.; Safronov, B. G.; Sinel'-
 nikov, K. D. (Academician AN UkrSSR)

TITLE: Energy spectra of a plasma interaction with a transverse
 magnetic field //

SOURCE: AN SSSR. Doklady*, v. 157, no. 6, 1964, 1335-1337

TOPIC TAGS: plasma source, plasma magnetic field, plasma trapping,
 plasma charged particle distribution, plasma axial inhomogeneity,
 plasmoid ionic component

ABSTRACT: This is a continuation of earlier tests by the authors
 (ZhTF v. 34, No. 7, 43, 1964), and its purpose is a detailed analy-
 sis of the ionic component of a plasma produced by a conical source
 and traveling in a magnetic field. The experimental setup for study-
 ing the interaction between plasmoids and a transverse magnetic
 21

Card 1/3

L 6728-65

ACCESSION NR: AP4044877

field was the same as used by the authors before, and the mass analyzer employed was that described by A. A. Kalmykov et al (pribyor* i tekhn. eksp. No. 5, 142, 1963). The results indicate that the ability of the plasma ions to penetrate through the transverse magnetic field increases with increasing m/Z (m -- ion mass, Z -- charge) and with decreasing ion energy. The plasma captured by the magnetic field contains much more hydrogen than the plasma ejected from the source. With increasing intensity of the magnetic field, the energy spectrum of the hydrogen ions of the plasma passing through the field shifts towards lower energies, whereas the energy spectrum of the protons of a plasma moving along the magnetic field shifts towards the higher energies. The results suggest that the density of the leading front of the plasma, where the higher-energy hydrogen ions are situated, is not high enough so that when the plasma enters the transverse magnetic field the front part of the plasmoid becomes detached. There is no broadening of the plasma pulses after passing through the magnetic field, and the perpendicu-

Card 2/3

L 6728-65

ACCESSION NR: AP4044877

lar ion velocity is very rapidly transformed into longitudinal velocity. Orig. art. has: 2 figures.

ASSOCIATION: Fiziko-tehnicheskii institut Akademii nauk UkrSSR
(Physicotechnical Institute, Academy of Sciences, UkrSSR)

SUBMITTED: 21Feb64

ENCL: 00

SUB CODE: ME

NR REF SOV: 003

OTHER: 001

Card 3/3

L 43920-66 ENT(1) IJP(c) CD/AT
ACC NR: AT6020398 (N)

SOURCE CODE: UR/0000/65/000/000/0021/0026

AUTHOR: Demidenko, I. I.; Lomino, N. S.; Padalka, V. G.; Safronov, B. G.; Sinel'-nikov, K. D.

ORG: none

TITLE: Possible occurrence of instabilities in a plasma captured by a transverse magnetic field 2/

SOURCE: AN UkrSSR. Issledovaniye plazmennyykh sgustkov (Study of plasma clusters). Kiev, Naukova dumka, 1965, 21-26

TOPIC TAGS: plasma containment, plasma instability, plasmoid, plasma injection

ABSTRACT: This is a continuation of earlier investigations of plasma captured by a transverse magnetic field (ZhTF, 1964, v. 34, 1183 and elsewhere). Although the conditions in the earlier investigations were such that no instabilities could develop in the plasma, the authors show that such instabilities can develop after the plasmoid passes through a diaphragm which is installed at a sufficiently large distance from the point of injection of the plasma in the magnetic field. At the large distance from the injection point, the plasmoid has a sufficiently large ratio of longitudinal energy to transverse energy, and an appreciable density gradient. The instability begins to develop in the region of maximum plasma density, and the inhomogeneity of the density over the cross section of the plasmoid stimulates the development of the instability. Arguments are presented in favor of classifying this as a

Card 1/2

I 24048-66 EWT(1)/EWT(m)/T IJP(c) GS/AT/GN

ACC NR: AT6008846

SOURCE CODE: UR/0000/65/000/000/0086/0088

AUTHOR: Lavrent'yev, O. A.; Nemashkalo, B. A.; Ovcharenko, L. I.; Safronov, B. G.; Sidorkin, V. A. 49
B+

ORG: none

TITLE: Measuring the energy of recharged particles in an electromagnetic trap 19

SOURCE: AN UkrSSR. Magnitnyye lovushki (Magnetic traps). Kiev, Naukova dumka, 1965, 86-88

TOPIC TAGS: hydrogen plasma, charged particle, magnetic trap, charge exchange, ionized plasma, ion energy

ABSTRACT: The authors measure ^{2/}the energy of a stream of recharged particles emerging from the end aperture in an electromagnetic trap. A diagram of the experimental equipment is given together with a brief description. Mass analysis of the stream of recharged particles emerging from the trap showed that it consists almost entirely of atomic hydrogen. Curves are given showing the energy distribution of ionized atoms with a residual gas pressure in the trap of $2 \cdot 10^{-5}$ mm Hg and injected electron energies of 2 kev and 2.8 kev. The density of the energy distribution for the recharged particles is related to the density of the energy distribution for the stream of ions in the trap by the formula

$$N_0(U) = \sigma_{10}(U) n_0 R N_i(U),$$

Card. 1/2

L 24048-66

ACC NR: AT6008846

where σ_{10} is the charge exchange cross section; n_0 is the density of the residual gas; R is the radius of the region occupied by the plasma. This relationship may be used to establish the energy distribution of the stream of ions circulating in the trap from the distribution of neutral ions. By narrowing the time interval for registration of the recharged particles, the variation in the intensity of a stream of ionized atoms of a given energy may be plotted as a function of time, which means that the same may be done for the intensity of ions of a given energy in the trap. It is shown that there is a hot plasma with an average ion energy of the order of 400 ev in an electromagnetic trap when the injected electrons have an energy of the order of 2 kev. The decay time after the injection pulse is 50-80 μ sec which agrees with the previously measured lifetime for hot electrons in this trap. A comparison of the lifetimes for ions with various energies shows large losses of low energy ions. This is apparently due to an increase in the cross section of resonance charge exchange for hydrogen ions at low energies. Orig. art. has: 3 figures.

SUB CODE: 20/

SUBM DATE: 20Oct65/

ORIG REF: 003/

OTH REF: 000

Card 2/2dda

I 41000-55 EWT(1) IJP(4) GD/AT
ACC NR: AT6020409 (N)

SOURCE CODE: UR/0000/65/000/000/0119/0129

AUTHOR: Voytsenya, V. S.; Gorbanyuk, A. G.; Onishchenko, I. N.; Safronov, B. G.;
Shkoda, V. V. 89
BT1

ORG: none

TITLE: Motion of the fast plasmoids in a magnetic field of toroidal solenoid

SOURCE: AN UkrSSR. Issledovaniye plazmennykh sgustkov (Study of plasma clusters).
Kiev, Naukovo dumka, 1965, 119-129

TOPIC TAGS: plasmoid, solenoid, plasma magnetic field, plasma density, plasma injection, interferometer, mass spectroscopy, ion distribution

ABSTRACT: The behavior of a plasmoid moving with several kev energy was studied in order to determine its upper density limit, its purity, and attainable velocity in longitudinal magnetic fields. This work is based on the theoretical predictions of N. A. Khizhnyak (ZhTF, 1965, 35, 847) who stated that due to shortcircuiting of polarization fields by electron currents rather high densities are attainable in the plasmoids. The experimental apparatus is described showing a curved region preceded by a straight section connecting with the plasma injector. The plasmoid properties were studied with a mass spectrograph, time-of-flight mass analyzer, microwave interferometer and electric and thermocouple probes. In the experiments with low density plasma, the ion dis-

Card 1/2

L 41C66-66

ACC NR: AT6020409

tribution was found to be considerably distorted. At 10^{12} cm^{-3} density, long high energy tails appear. In higher density experiments, the mean ion energy was found to be 3 to 5 kev, with an impurity content of 40%. A study of the solenoidal guiding field indicates that plasma densities higher than $10^{13} \text{ ions/cm}^3$ are possible if fields are increased above the 8 koe fields available to the authors. Orig. art. has: 10 figures.

SUB CODE: 20/

SUBM DATE: 11Nov65/

ORIG REF: 007/

OTH REF: 002

Card 2/2 *ldh*

L 26966-65 EWT(1)/EPA(sp)-2/T/EEC(t)/EPA(w)-2/EWA(m)-2 Pz-6/Po-1/Pab-10/Pi-4
IJP(c) AT
ACCESSION NR: AP5003252 S/0057/65/035/001/0154/0156

AUTHOR: Demidenko, I. I. / Lomino, N. S. / Padalka, V. G. / Safronov, B. G. / Sinel'nikov, K. D. /

TITLE: On possible development of instabilities in a plasma captured by a transverse magnetic field 21 42 41 B

SOURCE: Zhurnal tekhnicheskoy fiziki, v.35, no.1, 1965, 154-156

TOPIC TAGS: plasma, plasma instability, transverse magnetic field, longitudinal magnetic field

ABSTRACT: The development of instabilities in plasma bursts trapped by a transverse magnetic field and traveling parallel to it were investigated. The apparatus and the peculiarities of the capture and propagation of the plasma bursts have been previously described by four of the present authors (ZhTF 34,1183,1964). In the present experiments the plasma bursts passed through a 1.5 cm diameter circular aperture in a screen located 30 cm from the point of capture and were observed at various distances from the screen with a "plasmascop". When the screen was of dielectric material, or when it was of metal but floating, a tongue emerged from the more dense side of the plasma, grew, and reached the wall of the chamber after the plas-

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ACCESSION NR: AP5003252

ma burst had traveled some 60 cm from the screen. This instability is assumed to be of the Rayleigh-Taylor type and due to the rotation of the plasma, its inhomogeneity, and the presence within it of a net negative charge. When the screen was of metal and grounded, the development of this instability was almost entirely suppressed. Experiments were also performed with a screen containing a 4 mm wide slot instead of a circular aperture. In this case the instability did not develop. The failure of flute instability to develop in the plasma sheets that passed through the slot is discussed briefly. Orig.art.has: 4 figures.

ASSOCIATION: Fiziko-tekhnicheskii institut AN UkrSSR, Khar'kov (Physicotechnical Institute, AN UkrSSR)

SUBMITTED: 14 Aug64

ENCL: 00

SUB CODE: ME,EM

NR REF SOV: 004

OTHER: 005

Card 2/2

L 38100-65 EWT(1)/EPF(n)-2/EWG(m)/EPA(w)-2 Pz-6/Po-4/Pab-10/Pi-4 IJP(c)
 WW/AT S/0185/65/01C/002/0117/0122

ACCESSION NR: AP5005905

AUTHOR: Safronov, B. H. (Safronov, B. G.); Strashko, A. P.

TITLE: Simulation of the magnetic field of a Theta pinch

SOURCE: Ukrayins'kyi fizychnyy zhurnal, v. 10, no. 2, 1965, 117-122

TOPIC TAGS: Theta pinch, plasma pinch, magnetic field distribution

ABSTRACT: The authors state in the introduction that the elementary assumption that the magnetic fields of the induced currents in a θ -pinch is much smaller than the inducing magnetic field is not always correct, and if the external magnetic field is homogeneous the induced current in the θ -pinch is inhomogeneous and reverses sign near the turn. The authors therefore calculate the resultant field in a simple configuration wherein the pinch is represented by an annular conductor carrying a current and compare the results of the calculation with measurements of magnetic fields in a single-turn model of a pinch made in the form of a thin copper ring placed in a high-frequency field. The theoretical model of the pinch is represented by a single-turn bulky coil and a field induced in a short-circuited

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L 38100-65

ACCESSION NR: AP5005905

3

ring placed in the center of the coil. The experimental test set-up is shown in Fig. 1 of the Enclosure. The tests were made at a frequency of 2×10^5 cps. The calculations show that the magnetic field is not uniform and may reverse sign near the coil. The experimental data are in good agreement with the calculations. Measurements of the magnetic field distribution were made on single turn coils of length 200, 50, and 25 mm, and the results of the measurements differed little from one another, within the accuracy of the original calculations. "The authors thank K. D. Sinel'nikov and N. A. Khizhnyak for valuable advice." Orig. art. has: 6 figures and 7 formulas.

ASSOCIATION: Kharkivs'ky derzhuniversytet im. O. M. Gor'kogo
(Khar'kov State University)

SUBMITTED: 15May64

ENCL: 01

SUB CODE: ME, EM

NR REF SOV: 003

OTHER: 000

Card 2/3

DEMIDENKO, I.I.; LOMINO, N.S.; PADALKA, V.G.; SAFRONOV, B.G.; STNEL'NIKOV, K.D.

Instability occurring in a plasma gripped by a transverse magnetic field. Zhur. tekhn. fiz. 35 no.1:154-156 Ja '65.

(MIRA 18:3)

1. Fiziko-tekhnicheskiy institut AN UkrSSR, Khar'kov.

L 52920-65 EPF(n)-2/EPA(w)-2/EWT(1)/EWG(m) P1-4/Po-4/Pz-6/Pab-10 LJP(e) AT

ACCESSION NR: AP5012046

UR/0057/65/035/005/0823/0826

AUTHOR: Demidenko, I.I.; Lomino, N.S.; Padalka, V.G.; Safonov, B.G.; Sinel'nikov, K.D.

TITLE: Investigation of some properties of a plasma captured by a transverse magnetic field 21 51 50 B

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 5, 1965, 823-826

TOPIC TAGS: plasma trapping, plasma magnetic field, plasma polarization, plasma injection

ABSTRACT: The authors have previously found (ZhTF, 34, 43, 1964; DAN SSR, 157, 1335, 1964) that a portion of the plasma injected into a transverse magnetic field is captured by the field and moves parallel to it. They have continued their investigation of this phenomenon (which is not understood) with an apparatus similar to that previously employed, but larger. In the present apparatus the longitudinal magnetic field is maintained in a 12 cm diameter, 300 cm long drift tube; with the plasma transversely injected at the center of the drift tube, the motion of the captured plasma could be followed for 120 cm. The polarization of the captured plasma was observed with probes. After a decrease of 20 to 50% in

Ca/d 1/2

L 52020-65

ACCESSION NR: AP5012046

the first 80 or 40 cm, the polarization decreased only very slowly with distance from the injection point. The expected drift of the captured plasma in the crossed fields (the electric field due to polarization and the applied magnetic field) was observed with the aid of a slotted plastic diaphragm and a "plasma-scope" (L.I.Yelizarov and A.V.Zharinov, Nucl. Fus., Suppl., 2, 699, 1962). The effect of shorting out the plasma polarization with a copper disk was investigated; this was found, in accord with the findings of D.A.Baker and J.F.Hammel (Phys. Rev. Letters, 8, 157, 1962), to inhibit the transverse motion of the captured plasma. Orig. art. has: 2 formulas and 3 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR, Khar'kov (Physico-technical Institute, AN SSSR)

SUBMITTED: 18May64

ENCL: 00

SUB CODE: ME

NR REF SOV: 004

OTHER: 002

Card 2/2 MB

L 60325-65 EWT(1)/EPF(n)-2/EWG(m)/EPA(w)-2 Pz-6/Pe-4/P1-4 IJP(c) AT

ACCESSION NR: AP5018319

UR/0057/65/035/007/1330/1332
533

AUTHOR: Voytsenya, V. S.; Gorbanyuk, A. G.; Onishchenko, I. N.; Shkoda, V. V.;
Safronov, B. G.

TITLE: On the polarization of a plasma moving in a curved magnetic field

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 7, 1965, 1330-1332

TOPIC TAGS: plasma, plasmoid, plasma polarization, nonhomogeneous magnetic field

ABSTRACT: The authors have previously measured with probes the electric fields in plasma (from a conical plasma gun) which were moving in a uniform magnetic field (ZhTF, 34, 847, 1964) and shown that there is present a "radial" electric field directed toward the axis of the plasma. In the present paper they report similar measurements on plasmas moving in a toroidal magnetic field. In both groups of experiments the plasmas were produced by a conical plasma gun, passed through 2 cm diameter openings in two grounded plane electrodes, and drifted in a 6 cm diameter glass tube. In the present group of experiments the drift tube was bent into a 50 cm radius circle, thus forming a torus. Electric potentials were measured along the two principal diameters of the drift tube, i.e., parallel to the axis and to the large radius of the torus, respectively. When the radial

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L 60325-65

ACCESSION NR: AP5018319

2

field that was previously found to arise in a plasma moving in a uniform magnetic field was subtracted, the residual electric field was found to be in qualitative agreement with the polarization field expected theoretically in a plasma moving in a curved magnetic field. In a 600 Oe magnetic field the residual polarization field was 8 V/cm in the direction of the torus axis and 6 V/cm in the direction of the large radius. This latter value is several times larger than that calculated by N.A.Khizhnyak (ZhTF, 35, 847, 1965). This discrepancy can be due either to a less efficient short circuiting of the polarization field than was assumed in the theoretical derivation, or to the presence in the experimental plasmas of significant quantities of heavy ions. "In conclusion, the authors thank K.D. Sinel'nikov and H.A.Khizhnyak for valuable discussions." Orig. art. has: 1 formula and 3 figures.

ASSOCIATION: none

SUBMITTED: 21Sep64

ENCL: 00

SUB CODE: ME, EM

NO REF SOV: 006

OTHER: 000

Card 2/2 *DP*

ACC NR: AP7008906

SOURCE CODE: UR/0185/66/011/009/0982/0989

AUTHOR: Lavrent'yev, O. A.; Ovcharenko, L. I.; Safronov, B. ^G~~A~~; Sydorkin, V. O.

ORG: Physics-Engineering Institute, Ukrainian Academy of Sciences, Kharkov
(Fizyko-tekhnichnyy instytut AN UkrSSR)

TITLE: Electron injection into an electromagnetic trap

SOURCE: Ukrayins'kyi fizychnyy zhurnal, v. 11, no. 9, 1966, 982-989

TOPIC TAGS: electron beam, electron capture

SUB CODE: 20

ABSTRACT: The authors investigated the conditions of low-density electron beam capture in an electromagnetic trap. The position and dimensions of the cathode are determined so as to secure the most effective injection of electrons. The life of the electrons in the trap is measured and compared for the cases of magnetic and electromagnetic confinement of the plasma electrons. The mean neutral atom ionization and excitation energy loss by the electron is determined. The coefficient of magnetic field diffusion of the electrons as a result of collision with neutral atoms is measured. It is shown that with a magnetic field strength exceeding a certain critical value the escape of electrons from the trap is conditioned by diffusion processes only. Orig. art. has:

13 figures, 17 formulas and 1 table. [JPRS: 38,417]

Card 1/1

STEMPKOVSKAYA, I.A.; SAFRONOV, B.I.

Ion exchange method for removing zinc salts from waste waters.

Khim. volok. no.6:62-65 '61.

(MIRA 14:12)

1. Institut obshchey i neorganicheskoy khimii AN USSR (for Stempkovskaya).
2. Chernigovskiy zavod (for Safronov).
(Sewage--Purification) (Ion exchange)

SHEKHOVTSOV, N.A.; PROKHOROV, E.D.; SAFRONOV, B.V.

Internal oscillations in transistors with p-n-p-m structure.
Radiotekh. i elektron. 8 no.10:1783-1786 O '63. (MIRA 16:10)

1. Khar'kovskiy gosudarstvennyy universitet im. A.M.Gor'kogo.

~~SAFRONOV, D. D.~~ SAFRONOV, D. D.

42367 SAFRONOV, D. D. - Novby proyektionny metody kontvolya detaleyey v massovom proiz-
vodstve. (Zavod IM maslennikova). V sb: Opyt novatovov Mashinostroyeniya. Kuibyshev,
1948, S. 106-17.

SO: Letopis' Zhurnal'nykh Statey, Vol. 47, 1946

SAFRONOV, D.G. and KROVYAKOV, V.I.

Photographic Aircraft Equipment. Voenizdat (1949)

VOYTSENYA I.S.; GORBANYUK, A.G.; ONISHCHENKO, I.N.; SAFRONOV, D.G.

Motion of dense plasma clots in the magnetic field of a
toroidal solenoid. Zhur.tekh.fiz. 34 no. 2:280-287 F '64.
(MIRA 17:6)

SAFRONOV, D.I.
ZAPOL'SKIY, M.V.; SAFRONOV, D.I.; SPITSIN, M.Ye.

The casting of steel parts without shrink head. Torf.prom.32
no.4:15-17 '55. (MIRA 8:10)

1. Ivtofmash.
(Steel casting) (Peat machinery)

RUBINCHIK, I.M., kand. tekhn. nauk; SHEREMET'YEV, M.A., kand.
tekhn. nauk; SAFRONOV, D.I., inzh.; KITAYEV, B.N.,
kand. tekhn. nauk, retsenzent; FILIPPOVA, L.S., red.;
VOROB'YEVA, L.V., tekhn. red.

[Heating, ventilation and air-conditioning systems of
the new passenger cars] Sistemy otopeniia, ventiliatsii
i okhlazhdeniia vozdukha v novykh passazhirskikh vagonakh.
Moskva, Transzheldorizdat, 1963. 29 p. (MIRA 17:1)

SAFRONOV, F.G.

Attempts to advance the limits of Siberian agriculture to the
shores of the Pacific Ocean during the 18th century. Izv.Vses.
geog.ob-va 86 no.6:515-525 N-D '54. (MLBA 8:2)
(Siberia, Eastern--Agricultural colonies)

BASHARIN, Georgiy Prokop'yevich, doktor istor. nauk; SAFRONOV, F.G., kand.
istor. nauk, otvetstvennyy red.; KUSTUROV, D.V., red. izd-va;
PARNIKOV, Ye.S., tekhn. red.

[History of the incorporation of the Yakuts into the Russian
agricultural system] Iz istorii priobshchenia iakutov k
russkoi zemledel'cheskoi kul'ture. Iakuts, Iakutskoe knizhnoe
izd-vo, 1958. 50 p. (MIRA 11:8)

(Yakutia--Agriculture)

SAFRONOV, Fedot Grigor'yevich

[Russian peasants in Yakutia, from the 17th to the beginning of 20th century] Russkie krest'iany v Iakutii, XVII - nachalo XX vv. Iakutsk, Iakutskoe knizhnoe izd-vo, 1961. 494 p. (MIRA 15:10)
(Yakutia--Peasantry) (Yakutia--Agriculture)

BASHARIN, Georgiy Prokop'yevich, prof.; SAFRONOV, F.G., otv. red.;
D'YACHKOVSKAYA, L.S., red. izd-va; SOLOV'YEVA, Ye.P., tekhn.
red.

[History of animal husbandry in Yakutia from the second half
of the 19th century to the beginning of the 20th century]Isto-
riia zhivotnovodstva v Iakutii vtoroi poloviny XIX - nachala
XX v. Iakutsk, Iakutskoe knizhnoe izd-vo, 1962. 126 p.

(MIRA 16:1)

(Yakutia--Stock and stockbreeding)

PAVLYCHENKO, A.D.; SAFRONOV, G.D.; ODNODUSHNOV, A.V.; PROTASOV,
A.I.; GOLOBOKIY, I.R.; GRUNICHEV, A.S., kand. tekhn. nauk,
red.; ALEKSANDROVA, A.A., red.; BELYAYEVA, V.V., tekhn.red.

[Reliability of radioelectronic apparatus] Nadezhnost' radio-
elektronnoi apparatury. Moskva, Izd-vo "Sovetskoe radio,"
1963. 143 p. (MIRA 16:11)
(Radio industry--Quality control)

SAFRONOV, G.G.

System for the reconditioning and rejection of the SE-220
starters of daylight lamps. Tekst, prom. 25 no. 11:39 N '65,
(MIRA 18:12)

1. Starshiy inzhener-elektrik elektrotzdel'nykh
proizvodstva Yegor'yevskogo melanzhevogo kombinata.

SAFRONOV, G.M.

Liquid inclusions in artificial crystals of quartz. Trudy VNIIP
1 no.2:53-56 '57. (MIRA 12:3)
(Quartz crystals)

SAFRONOV, G.M.; KHADZHI, V.Ye.

Thermometric investigation of liquid inclusions in artificial
quartz. Trudy VNIIP 1 no.2:57-61 '57. (MIRA 12:3)
(Quartz crystals)

SAFRONOV, G.M.

Morphology of liquid inclusions in quartz crystals from the Pamirs:
Trudy VNIIP 1 no.2:155-159 '57. (MIRA 12:3)
(Pamirs---Quartz)

SAFRONOV, G.M.: KHADZHI, V.Ye.

Filling up cracks in artificial quartz crystals. Trudy VNIIP 1
no.2:165-166 '57. (MIRA 12:3)
(Quartz crystals)

SAFRONOV, G.M., Cand Geol-Min Sci --(diss) "Problems of defectology
of crystals of ^{the} natural and artificial piezo~~electric~~ ^{electric} crystal."

L'vov, 1959. 16 pp (Min of Higher Education USSR. L'vov State U
in Ivan Franko), 150 copies (ML, 12-59, 102)

-7-

TAMBOVTSEV, D.A.; SAFRONOV, G.M.; TEREENT'YEV, B.P.; SKORIKOV, V.M.

Stability of the operation of a reference voltage source using
ferroelectric bismuth tetanate crystals. Elektrichestvo
no.12:85-86 D '63. (MIRA 17:1)

SAFRONOV, G. P.

21 Mar 1948

USSR/Chemistry - Rubber
Rubber Plants

"Latex from Basic Rubber Plants," A. A. Prokof'yev, G. P. Safronov, M. K. Mazilkina,
Inst Plant Physiol imeni K. A. Timiryazev, Acad Sci USSR, Sci Res Inst Natural Rubber,
4 pp

"Dok Akad Nauk SSSR, Nova Ser" Vol LIX, No 9 p 1661

Latex obtained from basic rubber plants such as tausaghyz, kok-saghyz, etc., has very
high couchouc content. This depends much on condition of the plant, age, size, and
ENVIRONMENT. Gives data collected from studies on the size of the couchouc globules
from some five different types of rubber plants. Submitted by Academician N. A.
Maksimov, 24 Jan 1948.

PA 5172

A. SAFRONOV, G. P.

Customers

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15-1957-10-13712
Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 10,
p 43 (USSR)

AUTHOR: Safronov, I. N.

TITLE: The Problem of the Age of the Terraces Along the Kuban'
River (K voprosu o vozraste terras reki Kubani)

PERIODICAL: Materialy po izucheniyu Stavrop. kraya, Nr 7, Stravro-
pol', Knigoizdat, 1955, pp 83-95

ABSTRACT: As a result of field studies in 1950 and 1951 along the
Kuban' River from Armavir to Klukhori, the author has
prepared a preliminary analysis of the terraces of this
river and has ventured opinions on their ages. It is
noted that there is a divergence of opinion concerning
these terraces among a number of investigators (A. L.
Reyngard, G. F. Mirchink, and N. N. Sokolov). It is
emphasized that, in the environment of the Caucasus,
the age of the old moraines may be determined only by
reference to the age of the river terraces. Therefore,
all known stratigraphic classifications of the terraces

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15-1957-10-13712

The Problem of the Age of the Terraces Along the Kuban' River (Cont.)

of the Kuban', which are based on correlation with Alpine geochronology, are tentative. It has also been shown that the attempt of L. L. Reyngard (Tr. Azovo-Chernomorskogo geol. tres^tta, 1936, Nr 15) to determine the age of the Kuban' terraces by studying the interrelations of the terraces and the Pliocene continental deposits of western Predkavkaz'ye (Ciscaucasia) was unsuccessful. From a study of the geomorphology, the geological structure of the Kuban' terraces, and the paleontologic evidence, and also from the relation of these data to the terraces of the Podkumok River and to the lower layers of the travertines of Mashuk Mountain (Ivanova, I. K., Byul. Mosk. o-va ispytateley prirody, Otd. geol. 1946, vol 21, Nr 5; Nikolayev, N. I., Tr. Mosk. geol.-razv. in-ta, 1948, Nr 23), the author is able to determine the age relations of the terraces.

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(A) L 25644-66

ACC NR: AM5027779

Monograph

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Safronov, I. V. (Lieutenant-General, Retired), ed.

Handbook for the quartermaster (Spravochnik voyskovogo khozyaystvennika) Moscow, Voenizdat M-va obor. SSSR, 1965. 462 p. illus. 22,000 copies printed.

TOPIC TAGS: logistics, military transportation, sanitation hygiene

PURPOSE AND COVERAGE: This handbook was compiled on the basis of the official logistic service documents in force as of 1 March 1965. The book gives information on the basic problems of quartering service, subsistence supply service, clothing and equipment supply service, as well as fuel supply and military transportation service. Separate chapters deal with the requirements of sanitary, medical, and veterinary services, as well as supervision of the economic activities of military units. The book is intended for personnel of logistics systems, from the sergeant-major of the subunit to the deputy commanders of units and formations. It will also be useful to commanders of all ranks. There are 41 appendixes (tables, forms, etc.)

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